

**REMARKS**

Favorable reconsideration of this application, in light of the following discussion, is respectfully requested.

Claims 1, 4, 7, 8, 10, 53 and 55-67 are pending, with claim 1 amended, and claim 65-67 added by the present amendment. Claim 1 is independent.

In the Official Action, the title was objected to; claims 1, 4, 5, 10, 53, 55-56, 59-60 and 62 were rejected under 35 U.S.C. § 103(a) as being obvious over Slater I (U.S. Patent Pub. No. 2003/0015721) in view of Huang (U.S. Patent No. 6693352), Slater II (U.S. Patent Pub. No. 2002/0123164) and Lin (U.S. Patent Pub. No. 2002/0063256); claims 7-8 and 57 were rejected under 35 U.S.C. § 103(a) as being obvious over Slater I in view of Huang, Slater II, Lin and Sheu (U.S. Patent Pub. No. 2003/0122147); claim 58 was rejected under 35 U.S.C. § 103(a) as being obvious over Slater I in view of Huang (U.S. Patent No. 6693352), Slater II, Lin and Kim (KR 10/226831); claim 61 was rejected under 35 U.S.C. § 103(a) as being obvious over Slater I in view of Huang, Slater II, Lin and Tamamura (U.S. Patent No. 6,084,251); and claims 63-64 were rejected under 35 U.S.C. § 103(a) as being obvious over Slater I in view of Huang, Slater II, Lin and Asami (U.S. Patent No. 5,959,401). The previous indication of containing allowable subject matter in claims 55-57 was withdrawn. These rejections are respectfully traversed.

Applicant notes that paragraphs 6 and 7 of the Official Action both argue that claim 57 is rejected. However, the basis of rejection for claim 57 is only included in paragraph 7. Applicant surmises that the inclusion of claim 57 in paragraph 6 is a typographical error. Appropriate clarification is requested in the next Official Action.

The title is amended as requested in the Official Action. Claim 1 is amended, and claims 65-67 are added, to more clearly describe and distinctly claim Applicant's invention. Support for this amendment is found in Applicant's originally filed specification. No new matter is added.

Claim 1 is amended to recite, *inter alia*, "the high concentration GaN-based semiconductor layer and the first metal-Ga compound layer are formed based on reactions of the second conductive semiconductor layer and the first metal layer, respectively."

As noted in Applicant's specification, the material forming the first metal layer 1202 reacts with Ga of the P-(In, Al)GaN layer 1201 to be converted into a dual layer of the first metal-Ga compound layer 403/the first metal layer 404. Herein, the formed dual layer functions as a first diffusion barrier for suppressing the mutual reactivity with the semiconductor and the upper electrode material after the second metal layer 1203. At the same time, the P-(In, Al)GaN layer 1201 is converted into the P-(In, Al)GaN layer 401/the P+-(In, Al)GaN layer 402. The above structural conversion is accomplished because Ga vacancy formed in the P-(In, Al)GaN layer 401 due to formation of the first metal-Ga compound layer 403 functions as an acceptor in the P-type nitride semiconductor. Thus, the high concentration GaN-based semiconductor layer and the first metal-Ga compound layer are formed based on reactions of the second conductive semiconductor layer and the first metal layer, respectively

As acknowledged in the Official Action, Slater I, Huang and Slater II each fail to disclose or suggest Applicant's claimed feature of "a first metal layer formed on the first metal-Ga compound layer, the first metal layer being a substantially pure metal layer and including Cr or V." To cure this deficiency, the Official Action applies Lin.

Lin describes a light emitting device that includes a transparent conductive layer 184 deposited on the p-type GaN layer 160 and covering the ohmic contact dots 182. In Lin, the

transparent conductive layer 184 is an indium tin oxidation (ITO) layer, a cadmium tin oxidation (CTO) layer, an indium zinc oxidation (IZO) layer, a nickel oxidation (NiO) layer or a zinc oxidation (ZnO) layer. In another embodiment, a light reflective conductive layer replaces the transparent conductive layer 184. The light reflective conductive layer is argentum, chromium, aluminum, gold or copper.

However, the introduction of Lin's layers into the layers of Slater I, Huang and Slater II do not result in "a first metal layer formed on the first metal-Ga compound layer, the first metal layer being a substantially pure metal layer and including Cr or V." The remaining references do not cure the deficiencies of Slater I, Huang, Slater II and Lin. Thus, for a first reason, amended claim 1 patentably defines over the applied references.

Additionally, Applicant notes that the rejection of claim 1 is based on a 4-way combination of references. Applicant submits that the complexity of the current grounds rejection is rooted in an impermissible hindsight reconstruction of Applicant's claimed invention. In *KSR v. Teleflex*, 127 S. Ct. 1727, 1740 (2007), the Court noted that "[u]nder the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." The Court also noted that "a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103." However, the Court went on to note that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

Here, however, the Official Action fails to provide a rational reason, due to either a misunderstanding of the invention/references or hindsight reasoning, for combine the many layers of Slater I with various layers selected out of context from Huang, Slater II and Lin. Indeed, while the Official Action supplies alleged reasons for the various changes to Slater I needed to sustain the rejection, the sum-total of these various reasons are irrational at least because they rely upon purely conclusory statements about what one skilled in the art might do.

For example, page 4 of the Official Action states that the mere existence of Huang is evidence that ordinary workers skilled in the art would modify Slater. This statement is not a rationale for anything, but is a mere conclusory statement directly dismissed by the U.S. Supreme Court in *KSR*. The question to be addressed in the Official Action is why one skilled in the art, at the time of invention, would introduce specific features of Huang into Slater I. That is, the question to be addressed, and that is not addressed, is what need or problem would be solved or what benefit would achieved through the proposed combination. Indeed, the Official Action does not even explain what layers of Huang would be interspersed between what layers of Slater I, let alone why anyone would be motivated to make these insertions. Applicant submits that the mere existence of Huang is only evidence that one skilled in the art would create the invention of Huang, and is not evidence that one skilled in the art would modify Slater I in any fashion, let alone in the fashion suggested by the Official Action.

Similarly, page 5 of the Official Action offers similar legally irrational statements about both Slater II and Lin. As with Huang, the Official Action does not address what need or problem would be solved or what benefit would achieved through the proposed combination(s).

In summary, there is no rational reason to replace or augment the layers of Slater I with any of the layers of Huang, Slater II and Lin. Thus, for another reason, Applicant requests that the present rejection under 35 U.S.C. § 103(a) be withdrawn.

Furthermore, as noted in Applicant's last filed response and contrary to the Official Action, Huang does not disclose or suggest Applicant's claimed "high concentration GaN-based semiconductor layer formed on the second conductive semiconductor layer." Applicant's claimed high concentration GaN-based semiconductor layer (e.g., layer 402 of Applicant's specification) is not a cladding layer. However, applied layer 32 of Huang is an n-type cladding layer. Thus, at best, n-type cladding layer 32 of Huang corresponds to Applicant's claimed first conductive semiconductor layer (e.g., layer 2001 of Applicant's specification.) If Huang is again relied upon as teaching Applicant's claimed high concentration GaN-based semiconductor layer, Applicant requests a detailed rebuttal of Applicant's above analysis.

As none of the cited art, individually or in combination, disclose or suggest at least the above-noted features of independent claim 1, Applicant submits the inventions defined by claim 1, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.

MPEP 2141 notes that prior art is not limited just to the references being applied, but includes the understanding of one of ordinary skill in the art. MPEP 2141 further notes that the prior art reference (or references when combined) need not teach or suggest all the claim limitations. However, an obviousness-type rejection must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art. MPEP 2141 goes on to list exemplary rationales that may support a conclusion of obviousness. However, Applicant submits that the Official Action and the applied references

present no objective evidence that would support an obviousness-type rejection of Applicant's amended claims based on one of these exemplary rationales.

Turning now to new dependent claim 65, none of the applied references disclose or suggest Applicant's claimed second conductive semiconductor layer, high concentration GaN-based semiconductor layer, and transparent electrode layer including the same type dopant. Thus, new dependent claim 65 patentably defines over the applied references for independent reasons.

Turning now to new dependent claim 66, none of the applied references disclose or suggest Applicant's claimed substantially pure metal layer comprises V. Thus, new dependent claim 66 patentably defines over the applied references for independent reasons.

### CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

In view of the above amendment, Applicant believes the pending application is in condition for allowance.

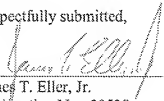
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael E. Monaco, Registration No. 52041 at the telephone number of the undersigned below to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Director is hereby authorized in this, concurrent, and future replies to charge any fees required during the pendency of the above-identified application or credit any overpayment to Deposit Account No. 02-2448.

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Respectfully submitted,

By

  
James T. Eller, Jr.

Registration No.: 39538

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road, Suite 100 East

P.O. Box 747

Falls Church, VA 22040-0747

703-205-8000